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REVIEW OF THE CURRENT MARKET SITUATION AND OUTLOOK

Market situation and outlook for bauxite, alumina and aluminium

Report by the UNCTAD secretariat

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INTRODUCTION AND SUMMARY

1. This report provides an overview of changes in the bauxite/alumina/aluminium market and industry during 1992 and 1993 and some indications concerning the outlook for 1994 and 1995. It should be noted that world production and consumption, unless otherwise stated, refer to the world excluding countries of Eastern Europe and socialist countries of Asia, the reason for this being the difference in availability of data between this group of countries and the rest of the world.

2. Following a drop in 1991, consumption of aluminium recovered in 1992, but declined again in 1993. The large differences in economic growth rates between the major aluminium consuming regions during the period resulted in correspondingly large variations in the development of aluminium consumption, with consumption growing rapidly in the United States, Germany and the United Kingdom but declining in Japan and in several European countries. Consumption of primary aluminium in Eastern European countries is estimated to have continued falling in 1992 and 1993, while in China consumption increased at very high rates.

3. World production of bauxite declined by 2.7 per cent in 1992, while alumina production declined by 0.5 per cent and production of primary aluminium by 0.1 per cent. In 1993, bauxite production increased during the first part of the year, and for the whole of 1993 it is likely to have been significantly higher than in 1992. Aluminium production is estimated to have increased by about 1.4 per cent, and production of alumina is likely to have increased at roughly the same rate.

4. In 1992, the cutbacks in aluminium production combined with relatively strong growth in world consumption would have led to a reduction in inventories by about 0.6 million tons if it had not been for imports from the Republics of the former USSR. As it happened, inventories instead increased by slightly more than 0.5 million tons. Inventories continued to grow in 1993, with a total increase of 1.16 tons, all of which can be attributed to continued large net imports from the Republics of the former USSR. The price of aluminium continued to be depressed by the large inventory levels and reached a low of US$ 1024 per ton in November 1993. Thanks to increased demand from the Republics of the former USSR, alumina prices held up somewhat better than aluminium prices until the last several months of 1993, when they turned down, while bauxite prices are reported to have fallen.

5. In August 1993, the European Community decided to impose limits on aluminium imports from the Republics of the former USSR. The measure did not, however, prohibit aluminium from being placed in London Metal Exchange (LME) warehouses. Only when the metal left the warehouse would it be counted against the limits. The decision had no discernible impact on the volume of exports from the Republics of the former USSR. The continued growth in inventories and the absence of indications that exports from the Republics of the former USSR are diminishing led to calls for concerted efforts or interventions in order to redress the imbalance. Intergovernmental discussions were initiated with the aim of identifying and agreeing on measures that would reduce the excess supply and that would be acceptable to all the parties concerned. Discussions involving Australia, Canada, Norway, the Russian Federation, the United States and the European Community in January 1994 resulted in a memorandum of understanding according to which the rate of world primary aluminium output in 1994 and 1995 will be reduced by an amount corresponding to 2 million tons per year compared to the rate of output in November 1992. Of the total, reductions corresponding to 0.5 million tons will be undertaken by producers in the Russian Federation. The aluminium industry in the Russian Federation will receive technical and financial assistance for modernization and restructuring.

6. Assuming that the memorandum of understanding is implemented in full and that the rate of primary aluminium output in market economy countries is reduced by 1.5 million tons compared to the rate of production in November 1992, production in 1994 will decline by about 1,220,000 tons as compared to 1993. If consumption is assumed to increase by 4 per cent, which appears reasonable against the background of the decline in 1993 and expectations of a slow upturn in the business cycle, this increase would correspond to slightly more than 600,000 tons. The production/consumption balance would thus change by more than

1.8 million tons. Assuming further that net exports from the Republics of the former USSR decline by 0.5 million tons, implying that consumption in these countries remains unchanged compared to 1993 and that Chinese imports increase by a further 100,000 tons, this would allow inventory reductions of 1.2 million tons. The trend of increasing inventories would thus be reversed, and although the supply overhang would still be large, since reported inventories of unwrought aluminium (IPAI and LME) would amount to about 3.2 million tons, or more than two and a half months' consumption of primary aluminium, it is likely that prices would strengthen gradually. Assuming that consumption increases by 0.5 million tons in 1995 and that production and Chinese imports are unchanged, inventories would be reduced to about 1.5 million tons by the end of that year - a level that could be considered normal. It appears likely that a gradual return to close to full capacity utilization in 1996 would be consistent with market equilibrium.

7. Total production capacity for metallurgical alumina is expected to increase by 1.6 million tons over the next two years. The cutbacks in primary aluminium production will lead to a significant weakening of the alumina market. Bauxite mine capacity is likely to increase by about 3.2 million tons in 1994/95, which means that the situation in the bauxite market, with an excess of supply over demand, is likely to remain unchanged.

8. In the longer term, the fact that aluminium is replacing other materials rather than being replaced by them implies that aluminium consumption will probably continue to grow at a rate higher than that of industrial production or GDP, assuming, of course, that the price of aluminium relative to other materials does not increase significantly. Smelter operating costs will probably increase in the future since the limits of what can be achieved through rationalization have been reached in many cases, and since prices of alumina and electric power are likely to rise. The rising costs, together with the experience of the present recession, may act as a disincentive to investment. There does not appear to be a large risk, however, that investment would be insufficient to meet demand later during this decade. Nevertheless, it is probably important not to retire too much capacity permanently in the present recession and to undertake the investments that will allow smelters that at present are inefficient or polluting to improve their operations. The risk of a shortage of alumina in the second half of this decade must be considered to be higher than the risk of an aluminium shortage.

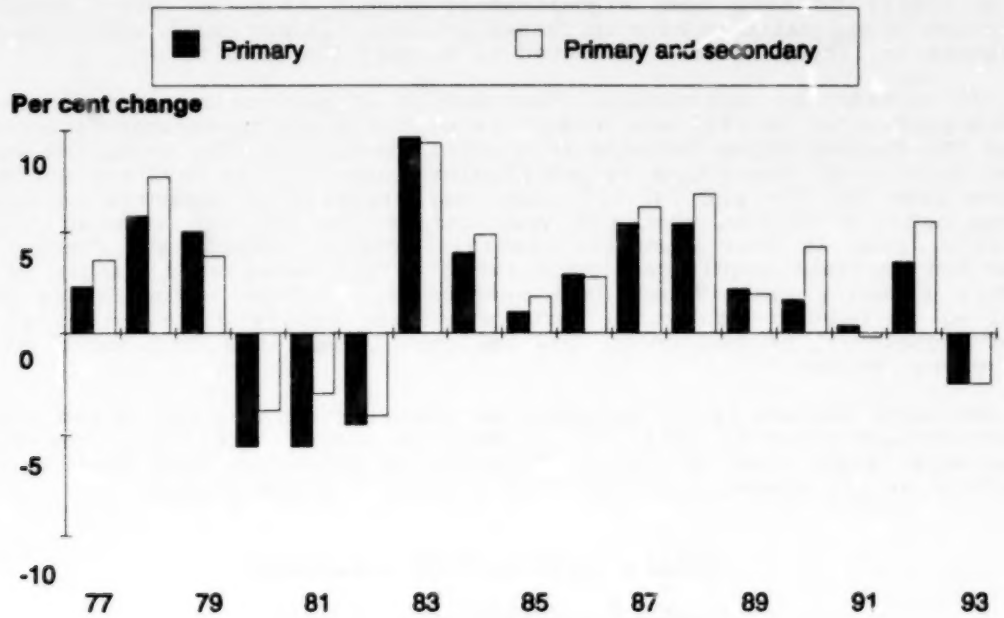
I. DEMAND[1]

9. Following a drop in 1991, world consumption (excluding countries of Eastern Europe and socialist countries of Asia) of aluminium recovered in 1992, with primary metal consumption increasing by 3.5 per cent and total consumption rising by 5.5 per cent. At the time of writing, data on world aluminium consumption in 1993 are not yet available. It is also difficult to make a reasonably accurate estimate, since, while production and inventory developments are known or can be estimated with a good degree of accuracy, net exports from countries of Eastern Europe and socialist countries of Asia to the rest of the world are unknown[2]. Assuming, however, that these net exports amounted to 1.2 million tons in 1993 (see section IV below), world primary aluminium consumption decreased by 2.5 per cent in 1993. Total consumption is likely to have decreased at about the same rate, since production in the automobile industry, which is a major user of recycled metal, has decreased in most countries concerned. Figure 1 shows the development of world consumption since 1977.

10. The large differences in economic growth rates between the major aluminium consuming regions during the period resulted in correspondingly large variations in the development of aluminium consumption. In North America, consumption of primary aluminium increased by 10 per cent in 1992, while total consumption, including secondary metal, increased by 13.5 per cent. The dramatic increase should be seen against the background of a very weak development of consumption, in particular of primary aluminium, since 1988. Demand is estimated to have continued increasing in 1993, reflecting the rise in the economic growth rate. In Europe, primary consumption rose by 3.1 per cent in 1992, reflecting strong demand in Germany as a result mainly of infrastructural investments following reunification, and in the United Kingdom, while elsewhere consumption declined or stagnated due to the weak growth rates. Total consumption increased at about

the same rate, reflecting that sectors using recycled aluminium are relatively less important in Europe than in North America. Consumption in 1993 is likely to have declined since the expected economic upturn did not materialize. In Japan, primary consumption declined by 5.1 per cent in 1992. Total consumption, which was supported to some extent by a continued strong increase in demand for beverage cans and constant consumption in the transportation industry, both of which use large amounts of secondary metal, fell by 2.9 per cent. Consumption is likely to have fallen in 1993 as well, although possibly at lower rates than in 1992[3].

Figure 1 Annual change in world aluminium consumption 1977-1993



Source: Metallgesellschaft: Metal Statistics; UNCTAD secretariat.

11. Accurate data on consumption in countries of Eastern Europe and socialist countries of Asia are not readily available. However, consumption of primary aluminium in Eastern European countries, which is estimated to have fallen by 18.8 per cent in 1991, reflecting the decline in industrial activity brought on by the economic transformation, is believed to have fallen by a further 5.9 per cent in 1992. It should be noted that these estimates are considered to be very uncertain, and that the decline in consumption may have been larger, in particular in the republics of the former USSR. Total consumption, including secondary metal, is likely to have declined more, since secondary metal production is reported to have fallen dramatically due to a shortage of scrap[4]. Consumption in China was spurred on by the extremely high rate of growth in industrial production and increased by 33.7 per cent in 1992, more than offsetting the decline in Eastern Europe, following an increase of 11.4 per cent in 1991. Accordingly, total world consumption of primary aluminium, including consumption in these countries, is estimated to have increased by 3.7 per cent in 1992, while consumption of primary and secondary metal is estimated to have risen by 5.3 per cent. In 1993, consumption in Eastern Europe is likely to have continued its decline while consumption in China has continued to grow rapidly.

II. SUPPLY

A. Production of bauxite, alumina and aluminium 1992 - 1993[5]

12. World production of bauxite (excluding countries of Eastern Europe and socialist countries of Asia) declined by 2.7 per cent in 1992, while alumina production declined by 0.5 per cent and production of primary aluminium by 0.1 per cent. The differences in the rates of decline between the production stages are likely to reflect underlying errors in estimates used for the statistics. In the case of bauxite, reductions in output rates, undertaken in order to allow stocks to be drawn down, may also have played a role.

13. In 1993, bauxite production increased during the first part of the year, and is likely to have been significantly higher than in 1992[6]. Aluminium production is estimated to have increased by about 1.4 per cent[7], and production of alumina is likely to have increased at roughly the same rate.

14. As regards the geographical distribution of production, the decline in bauxite production in 1992 was relatively evenly distributed among producers, as was the corresponding decrease in alumina production. The exception was in former Yugoslavia, where bauxite and alumina production in 1992 are estimated to have been 800,000 and 340,000 tons respectively, as compared to over 3 million and 1.2 million tons per year before the war. As regards primary aluminium, only in four countries (Bahrain, Brazil, Canada and France) did production increase significantly in 1992, in all cases as a result of new capacity becoming operational (see section B.1). Cuts in operating rates resulting in reduced production were relatively evenly distributed. In the former Yugoslavia, production in 1992 fell to 170,000 tons from about 350,000 tons before the war.

15. No major changes in the geographical distribution of bauxite and alumina production took place in 1993. At the smelting stage, cutbacks in the United States were larger than in the other producing countries (see section B.2). Production at all stages continued to decline in Eastern Europe.

B. Specific factors affecting supply

1. Changes in production capacity

16. World bauxite production capacity (excluding countries in Eastern Europe and socialist countries of Asia) increased by about 1.5 million tons in 1992-1993. The changes included the closure of the Moengo mine in Suriname in 1992, the opening of the Accaribo mine in the same country, the expansion of the mine at Los Pijiguaos in Venezuela and the expansion of the Nain mine in Jamaica (see table A.1 in the annex). No mines were opened or closed in 1993. It should be noted that capacity figures for bauxite mines have to be interpreted with caution, since in many cases, given the nature of most bauxite deposits, capacity changes can be implemented relatively easily. It is therefore difficult to distinguish between temporary changes in operating rates and more permanent changes in capacity. Furthermore, capacity is often expanded in small increments which are usually not reported in trade journals.

17. Alumina production capacity increased by almost 2 million tons over the period, with most of the increase taking place in 1993 (see table A.2 in the annex). The entire increase was accounted for by expansions of existing refineries. Australia, Venezuela, Jamaica and Brazil accounted for most of the increase in capacity.

18. Primary aluminium production capacity increased by about 850,000 tons over the period, with almost the entire expansion taking place in 1992 (see table A.3 in the annex). The net increase was composed of additions to capacity corresponding to 1,065,000 tons per year, of which 645,000 tons at new smelters, and partial or complete shutdowns corresponding to about 200,000 tons per year. Canada accounted for more than half of the new capacity, with two new smelters, Alumax's Deschambault smelter and the Alouette smelter, owned by an international consortium with participation by the Government of Quebec, entering production. The only other new smelter to come on stream during the period was the Dunkerque smelter in France. Existing smelters were expanded in

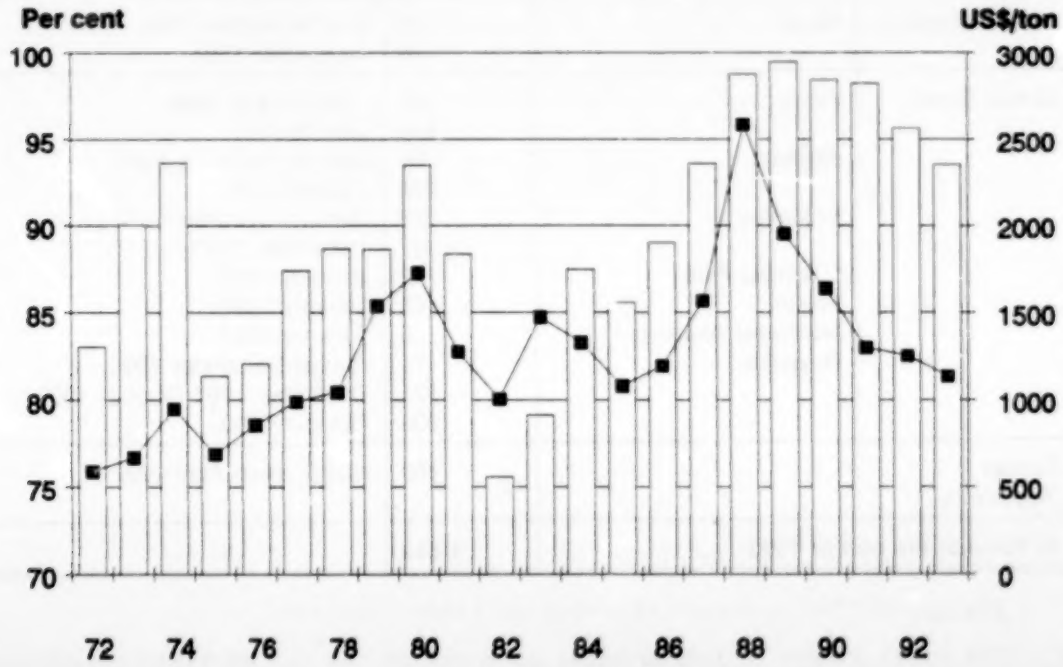
Australia, Bahrain and the Islamic Republic of Iran. Smelters were closed down in Austria, India and Italy.

19. Changes in production capacity in the countries of Eastern Europe and in socialist countries of Asia are not included in the above figures. The economic transformation of the former group of countries has had a severe impact on the mining and metallurgical industry, with several operations being closed down due to their lack of competitiveness and because they do not conform with new environmental regulations. In Hungary, three of the four smelters were closed down at the end of 1992, and bauxite and alumina output has also been reduced as a consequence. At the large Slatina smelter in Romania, 60 per cent of capacity has been closed down due to a shortage of power. Exports have been cancelled because of lack of international competitiveness. Finally, it is difficult to establish to what extent production capacity in the bauxite/alumina/aluminium industry in the former Yugoslavia has been destroyed in the war. It is known that for instance the Mostar refinery/smelter complex in Bosnia-Herzegovina has been destroyed, and that it is unlikely to be rebuilt.

2. Changes in operating rates

20. As observed in the market review prepared in 1993 for the Second Ad hoc Review Meeting on Bauxite[8], operating rates of aluminium smelters have remained high in the present recession despite very low prices. Figure 2 shows aluminium prices and capacity utilization in aluminium smelters during the period 1972 to 1993[9]. While production has been reduced during the current recession, the reductions have clearly not been sufficient to reestablish the balance between supply and demand, in particular since they were undertaken relatively late. Table 1 shows cutbacks in the operating rates of existing aluminium smelters during the period 1991 to 1993.

Figure 2 Capacity utilization in aluminium smelters and price 1972-1993



Sources: International Primary Aluminium Institute (capacity and production); UNCTAD: Commodity Price Bulletin (prices)

Table 1: Cutbacks in operating rates of primary aluminium smelters in 1991-1993 (1 000 metric tons per year)

Country	Company	Quantity	Effective from-to
Argentina	Aluar	15	October 1991-
Brazil	Alcan	27	November 1992-
	Valesul	23	September 1993-January 1994
Canada	Alcan	68	November 1991-October 1992
France	Pechiney	44	December 1992-
Germany	Vereinigte	32	October 1991-October 1992
	Aluminiumwerke (VAW)	105	October 1992-
	Alusuisse	90	March 1992-
	Hoogovens	9	End 1991-
Mexico	Grupo Carso (ex-Alcoa)	55	Autumn 1991-July 1992
		80	July 1992-
Netherlands	Pechiney	22	October 1991-December 1992
		35	December 1992-
	Hoogovens	9	End 1991-
New Zealand	Comalco	86	June-July 1992 (power shortage)
Norway	Hydro	45	November 1991-
Sweden	Gränges	20	December 1991-
United Kingdom	Alcan	10	July-November 1991
		76	November 1991-
United States	Alcoa	42	January-July 1993
		310	July 1993-
	Alumax	64	January-February 1993
		104	February 1993-
	Columbia	27	January-December 1993
		37	December 1993-
	Columbia Falls	42	January 1993-
	Kaiser	68	January 1993-
	Northwest Aluminium	5	January 1993-
	Reynolds	71	August-December 1991
		121	December 1991-October 1993
		209	October 1993-
Former Yugoslavia		180	Mainly since April 1992
In force at the end of 1993		**1 533**	

Source: UNCTAD secretariat based on trade journals.

21. The total amount of the cutbacks in force at the end of 1993 corresponded to more than 1.5 million tons per year, or about 10 per cent of capacity. Actual cutbacks may be larger, since there is no certainty that all cutbacks are reported. Smelters in the United States, in particular those operated by Alcoa and Reynolds, accounted for most of the cutbacks at almost 800,000 tons. Some of these cutbacks were however forced on smelters due to the reductions in power deliveries undertaken by the Bonneville Power Administration at the beginning of 1993 as a result of lower than normal rainfall in the northwestern part of

the country. In January 1994, Alcan announced that it would reduce output by a further 156,000 tons per year, with reductions taking place mainly in Canada and the United States[10]. It should be noted that the cutbacks are not fully reflected in figure 2, which shows capacity utilization as annual production in relation to mid-year capacity.

22. The lateness and relatively small amount of cutbacks in operating rates during the present recession is in contrast with the experience during previous periods of low prices. As discussed in the market review prepared in 1993, there are several explanations for this, the most important of which are probably the reduced degree of concentration in the industry and the fact that smelters have succeeded in insulating themselves from some of the effects of price falls by linking input prices to the price of aluminium. Another important factor may be that the costs of exit have increased for many smelters. In many cases, power tariffs have an important fixed component or "bottom charge" which has to be paid whether the smelter is producing or not. Long-term contracts for other inputs may also have to be honoured for a long time after closure. Finally, reductions in personnel may be very expensive to undertake or may not even be permitted. For all these reasons, smelters may choose to continue producing although prices do not cover even direct cash production costs.

3. Developments in costs of production

23. Operating costs of aluminium smelters are estimated to have continued decreasing in 1992 and 1993. The main reasons for the fall in costs are declining alumina prices (in long-term contracts the alumina price is often tied to the price of aluminium) and, more importantly, the rise in the exchange rate of the US dollar against most other currencies. Average operating costs are estimated to be 50.4 US cents per pound (US$ 1110 per ton). As a result of the changes in exchange rates, smelters in the United States now have higher average operating costs than smelters in Europe[11]. Expected increases in power tariffs may widen the gap further[12]. At the prices prevailing in early 1994, a high proportion of smelters, probably more than half of those in operation, were unable to cover operating costs. Production costs for alumina and bauxite have been more stable than for primary aluminium, although operating costs in many alumina refineries have been reduced significantly over the past several years as a result of continuous rationalization.

III. TRADE

24. The most important development in international trade in aluminium in recent years has been the massive increase in exports from the Republics of the former USSR, in particular the Russian Federation, to the international market. Official exports from the Russian Federation in 1992 were 959,300 tons, up from 763,400 tons in 1991[13]. To this should be added about 400,000 tons of exports from other republics, mainly Tajikistan, in 1992. Unofficial exports may have added further significant quantities. There is no sign of exports having declined, and estimates of total exports from the Republics of the former USSR in 1993 vary from 1.2[14] to 1.9 million tons[15]. It is noteworthy in this context that a large portion of Russian exports, probably about two thirds, represents aluminium that is toll smelted in the Russian Federation.

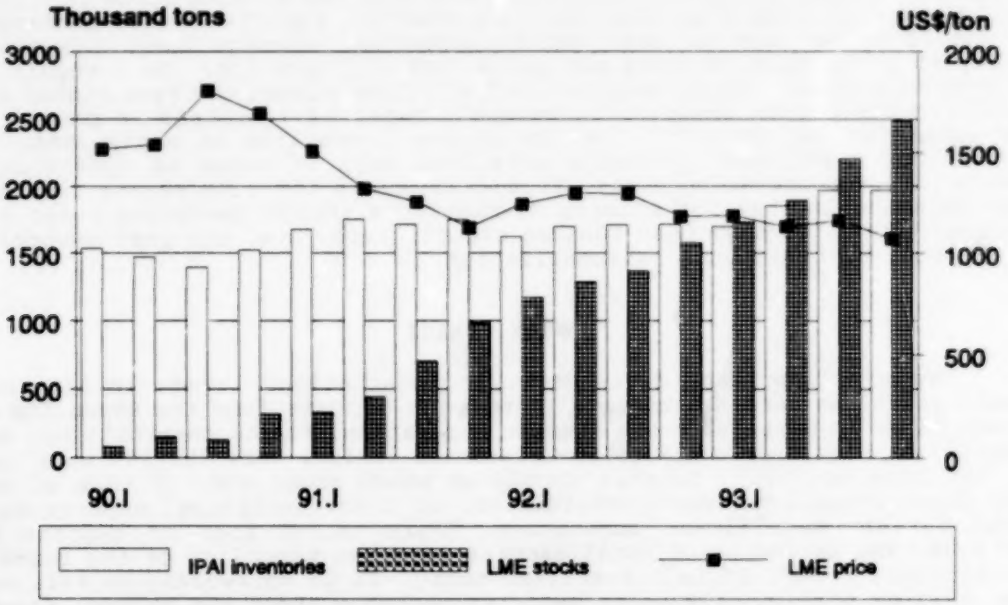
25. In August 1993, the European Community decided to impose limits on aluminium imports from the Republics of the former USSR. From August until the end of November, imports were limited to 60,000 tons, corresponding to 15,000 tons per month[16]. Subsequently, the same limits were extended from December 1993 to the end of February 1994. The measure did not, however, prohibit aluminium from being placed in London Metal Exchange (LME) warehouses. Only when the metal left the warehouse would it be counted against the limits. The decision had no discernible impact on the volume of exports from the Republics of the former USSR. Neither did it have any immediate effect on the discounts on metal from these countries that have been applied by the industry and which range from US$ 20 to 100 per ton[17]. Only at the end of the year did the discounts diminish as exports from the Republics of the former USSR were increasingly rerouted to the United States and Japan[18]. The decision was criticized by some representatives of the secondary aluminium industry in the European Community on the grounds that it deprived that industry of a source of cheap raw material and worsened

its competitive position relative to producers in other countries that did not face the same restrictions[19]. It was also criticized by representatives of primary aluminium producers outside the European Community, who saw it as ineffective and failing to address the reasons for the imbalance in the market[20].

IV. SUPPLY/DEMAND BALANCE AND PRICES

26. In 1992, the cutbacks in aluminium production combined with relatively strong growth in world consumption (excluding countries of Eastern Europe and socialist countries of Asia) would have led to a reduction in inventories by about 0.6 million tons if it had not been for imports from the Republics of the former USSR. As it happened, inventories instead increased by more than 0.5 million tons[21]. Inventories continued to grow in 1993, with a total increase of 1.16 million tons. Assuming that Chinese imports were about 400,000 tons (up from 230,000 tons in 1992), which seems likely in view of the continued rapid growth of industrial production, and assuming further that net exports from Eastern Europe, including the Republics of the former USSR, were 1.6 million tons, world consumption decreased by about 380,000 tons or 2.5 per cent. Table 2 shows how the supply/demand balance evolved during 1992/93 and figure 3 shows the development of inventories and the aluminium price during the period 1990 to 1993.

Figure 3 Unwrought aluminium stocks and prices



Sources: International Primary Aluminium Institute; UNCTAD secretariat.

27. The price continued to be depressed by the large inventory levels in 1992 and 1993 and reached a low of US$ 1024 per ton in November 1993. While this level does not constitute the "collapse" of the price that was seen to be a possibility in the market review prepared in 1993[22], it is nevertheless a level at which only very few aluminium producers are able to cover their costs and which does not provide any incentive for investment. It might be asked why the price stayed at roughly the same level from the second half of 1991 until the beginning of 1994, in spite of growing inventories and a seeming inability on the part of producers to make the necessary supply adjustments. The answer is likely to be that speculators found aluminium at around US$ 1100 per ton to be a reasonably attractive investment at the prevailing low rates of interest and that they were therefore prepared to continue financing the inventories in the

hope that the price trend would turn upward again in the relatively near future, possibly as a result of increased production cutbacks expected to result, inter alia, from intergovernmental discussions. In response to the agreement reached in those discussions (see paragraph 28) the price increased, but not by more than about 10 per cent, which would appear to indicate that the market had to some extent already discounted the news.

Table 2
Supply/demand balance (market economy countries) for primary aluminium 1992-93 (thousand metric tons)

	1992[a]	1993[b]
Production	14,915	15,100
Consumption	15,523	15,140
Surplus (+) or deficit (-)	-608	-40
Net imports[c]	+1,134	+1,200
Change in inventories	+526	+1,160

[a] Production from World Bureau of Metal Statistics, consumption from Metallgesellschaft: Metal Statistics, change in inventories from the International Primary Aluminium Institute (IPAI and LME stocks), net imports estimated by the UNCTAD secretariat.
[b] Estimated by the UNCTAD secretariat.
[c] From Eastern Europe and socialist countries of Asia

28. The continued growth in inventories and the absence of indications that exports from the Republics of the former USSR are diminishing have led to calls for concerted efforts or interventions in order to redress the imbalance. Intergovernmental discussions were initiated with the aim of identifying and agreeing on measures that would reduce the excess supply and that would be acceptable to all the parties concerned. Discussions involving Australia, Canada, Norway, the Russian Federation, the United States and the European Community were held in Moscow in October 1993, Washington D.C. in December 1993, and Brussels in January 1994. The discussions resulted in a memorandum of understanding according to which the rate of world primary aluminium output in 1994 and 1995 will be reduced by an amount corresponding to 2 million tons per year compared to the rate of output in November 1992. Of the total, reductions corresponding to 0.5 million tons would be undertaken by producers in the Russian Federation. The aluminium industry in the Russian Federation will receive technical and financial assistance for modernization and restructuring.

29. Alumina prices have held up somewhat better than aluminium prices. Prices on the spot market for alumina increased in mid-1992 from a range of US$ 130 to $ 140 per ton to $ 165 to $ 175 and remained at that level until mid-1993 in spite of the weak development of aluminium production. The reason for the rise in prices was increased demand from the Republics of the former USSR, where some refineries have had difficulties maintaining production levels. The war in the Republics of the former Yugoslavia, which was an important supplier of alumina to the USSR, has affected deliveries from these countries and increased the need for larger imports from other suppliers. It has been reported that a large portion of the alumina exports to the Russian Federation is accounted for by tolling arrangements where alumina is converted to aluminium[23]. In the last several months of 1993, however, alumina prices fell by US$ 30 to 35 per ton, as cutbacks in primary aluminium output, particularly in the United States, took effect[24]. In response to the reduced demand, the largest producer, Alcoa of Australia, reduced its production in the final quarter of 1993 by 6 per cent[25].

30. Prices for bauxite have been more affected by the weak aluminium market than alumina prices, mainly because there has been no positive development corresponding to the increased ex-USSR purchases in the case of bauxite. Bauxite prices in long-term contracts are normally linked to the aluminium price and have been exposed to the impact of its fall, although the effect has been softened by the fact that normally only 50 per cent of the price is determined in this manner. Nevertheless, bauxite from Trombetas in Brazil was reported to

have been sold at prices of about US$ 21 per ton in mid-1993, down from $ 28 earlier, while the price of material from the Boke mine in Guinea was understood to have fallen from $ 31 to $ 32 to around $ 25 per ton[26]. It is generally estimated that significant excess capacity exists in the bauxite market[27]. To some extent, the surplus will be augmented by planned releases of about 4.2 million tons of bauxite from the United States National Defense Stockpile over five fiscal years, starting in fiscal 1993[28].

V. OUTLOOK

A. Outlook for 1994-1995

31. Assuming that the memorandum of understanding referred to in the previous section is implemented in full and that the rate of primary aluminium output in market economy countries is reduced by 1.5 million tons compared to the rate of production in November 1992, production in 1994 will decline by about 1,220,000 tons as compared to 1993. If consumption is assumed to increase by 4 per cent, which appears reasonable against the background of the decline in 1993 and expectations of a slow upturn in the business cycle, this increase would correspond to slightly more than 600,000 tons. The production/consumption balance would thus change by more than 1.8 million tons. Assuming further that net exports from the Republics of the former USSR decline by 0.5 million tons, implying that consumption in these countries remains unchanged compared to 1993, and that Chinese imports increase by a further 100,000 tons, this would allow inventory reductions of 1.25 million tons. The trend of increasing inventories would thus be reversed, and although the supply overhang would still be large, since reported inventories of unwrought aluminium (IPAI and LME) would amount to about 3.2 million tons, or more than two and a half months' consumption of primary aluminium, it is likely that prices would strengthen gradually. Assuming that consumption increases by 0.5 million tons in 1995 and that production and Chinese imports are unchanged, inventories would be reduced to about 1.5 million tons by the end of that year - a level that could be considered normal. It appears likely that a gradual return to close to full capacity utilization in 1996 would be consistent with market equilibrium, taking into account both the only significant planned addition to capacity (the Alusaf Hillside smelter in South Africa) and assuming continued growth in consumption at an annual rate of 2-3 per cent.

32. The only major addition to alumina production capacity in 1994/95 will be the Alunorte refinery in Brazil, which is likely to enter into operation in 1995. Total production capacity for metallurgical alumina is expected to increase by 1.6 million tons over the next two years. The cutbacks in primary aluminium production will lead to a significant weakening of the alumina market. The weakening is however likely to be temporary, and a need for new investment would materialize relatively quickly (see section B below).

33. Bauxite mine capacity is likely to increase by about 3.2 milion tons in 1994/95 as the result mainly of expansions taking place at the Trombetas mine in Brazil and the Panchpatmali mine in India. Accordingly, the situation in the bauxite market, with an excess of supply over demand, is likely to remain unchanged.

B. Long term outlook

34. Over the past several years, two sectors have shown a more dynamic development of demand than others: packaging, in particular beverage cans, and the automobile industry. In the case of beverage cans, world consumption is expected to grow at an annual rate of 7.4 per cent from 1993 to 2000. While aluminium has captured almost the entire market for metal beverage containers in the United States, where shipments of can sheet are still forecast to increase at an annual rate of 2 per cent until the year 2000, it has a market share of 60 per cent in Europe and 50 per cent in Japan, leaving ample room for further expansion[29].

35. Aluminium use in the automobile industry has also expanded, most rapidly in Japan, where the average aluminium content of cars was 101 kilograms in

1991[30]. Aluminium consumption by the Japanese car industry increased at an annual rate of 6.1 per cent from 1980 to 1992, compared to 3.7 percent for total aluminium consumption[31]. Driving this development is the need to reduce petrol consumption, both in order to conserve energy and to reduce airborne pollution from road traffic. Extensive use of aluminium is thus no longer confined to luxury or sports cars but is becoming more common also in lower priced models. It is worth noting, on the other hand, that the Japanese automobile manufacturer Mazda, which pioneered the use of aluminium sheet in car bodies, is reported to be considering going back to steel for cost reasons[32]. Nevertheless, the fact that aluminium is replacing other materials rather than being replaced by them implies that aluminium consumption will probably continue to grow at a rate higher than that of industrial production or GDP, assuming, of course, that the price of aluminium relative to other materials does not increase significantly.

36. Beyond the next couple of years, smelter operating costs are likely to increase since the limits of what can be achieved through rationalization have been reached in many cases, and since alumina prices are likely to rise in order to permit investment in new refining capacity. It is also uncertain whether power suppliers in the future will be willing to enter into the kind of variable price-linked power rate contracts that have been concluded over the past several years, given their recent experience of low prices and consequent loss of potential revenue[33]. Smelters using power from fossil fuel power plants are likely to have to contribute to the costs incurred as a result of more stringent regulations concerning air pollution, while new smelters requiring investment in new hydro power generating facilities are likely to be faced with higher costs resulting from increasing costs of construction. The rising costs, together with the experience of the present recession, may act as a disincentive to investment.

37. There does not appear to be a large risk, however, that investment would be insufficient to meet demand later during this decade. A large number of smelter projects are currently at the planning stage, while four new smelters are under construction - the Alusaf smelter in South Africa (planned capacity 460,000 tons per year, to be completed late 1995), the Bandar Abbas smelter in the Islamic Republic of Iran (220,0000 tons, 1996/97), the Aluyana smelter in Venezuela (215,000 tons, 1996/97) and the ALSCON smelter in Nigeria (180,000 tons, 1996/97). None of the other planned smelters is likely to be in operation before the end of 1997[34]. Assuming that expansions of existing smelters will add another 200,000 tons of capacity, potential production in 1997 would be about 17.4 million tons. If average annual growth in consumption from 1992 to 1997 is assumed to be 3 per cent, demand in the latter year would be 18 million tons. The Republics of the former USSR are likely to remain significant net exporters and would make up the apparent shortfall. Furthermore, production capacity in existing smelters can be increased relatively easily if needed, and the assumption concerning consumption may turn out to have been overly optimistic. Nevertheless, the example illustrates that it is important not to retire too much capacity permanently in the present recession and to undertake the investments that will allow smelters that at present are inefficient or polluting to improve their operations. If this is to be possible, however, the present gap betweeen supply and demand will have to be closed, making it possible for prices to return to levels that will permit investment.

38. A particular situation exists with regard to alumina. According to industry observers, many of the existing alumina refineries in the Republics of the former USSR will not be competitive once market based prices for their inputs are introduced[35]. Consequently, the need for alumina imports into these countries, which is already considerable, may increase. Taking into account the long lead time for construction of alumina refineries, the risk for a shortage of alumina in the second half of this decade must be considered to be higher than the risk for an aluminium shortage[36].

Notes

1. Unless otherwise indicated, data on consumption are from Metallgesellschaft: Metal Satistics. See also UNCTAD: Bauxite, alumina and aluminium statistics 1982-1992. Report by the UNCTAD secretariat (TD/B/CN.1/RM/BAUXITE/8).

2. While in theory these exports could be estimated on the basis of available trade data from importing countries, which cover most of 1993, this is not possible in practice since a very large proportion of exports from the republics of the former USSR are added to existing stocks in London Metal Exchange warehouses. The metal is not counted as imported until it leaves the warehouse for its final destination. Therefore, available trade data cover only a portion of exports from the countries concerned.

3. Production of semifabricates and foil in Japan declined by 3.4 per cent in April-September 1993 compared to the same period in 1992 (Japan Metal Bulletin, Tokyo, 1 September 1993)

4. Secondary aluminium production in the former USSR republics is reported to have fallen by about half in 1992 (Energy, Mines and Resources Canada: Canadian Minerals Yearbook 1992, Ottawa 1993). In the first six months of 1993, secondary production declined by a further 41 per cent compared to the same period in 1992 (Metals Week, New York, 9 August 1993).

5. Unless otherwise indicated, data on production are from World Bureau of Metal Statistics. See also UNCTAD: Bauxite, alumina and aluminium statistics 1982-1992 (TD/B/CN.1/RM/BAUXITE/8).

6. Bauxite production in the first nine months of 1993 was 3 per cent higher than during the corresponding period in 1992.

7. According to figures from the International Primary Aluminium Institute.

8. See UNCTAD: Market situation and outlook for bauxite, alumina and aluminium (TD/B/CN.1/BAUXITE/2), Geneva, 1993.

9. The figures for production and capacity are from the International Primary Aluminium Institute (IPAI). It is known that these figures, which are based on reports directly from the companies, often understate actual capacity and that therefore "real" capacity utilization may in fact be somewhat lower than is implied. Nevertheless, the IPAI data have been used here since they constitute the only consistent time series for capacity.

10. Metals Week, New York, 17 January 1994.

11. Aluminium industry analyst Anthony Bird, quoted in Metal Bulletin, London, 5 August 1993.

12. The Bonneville Power Administration has proposed to raise power rates for aluminium smelters by 14 per cent. Ten smelters with a combined capacity of 1.6 million tons per year in northwestern United States would be affected. In the longer term, it is uncertain whether variable rate contracts will be retained (Metals Week, New York, 16 August 1993). For smelters in other parts of the United States, which often rely on power from generating facilities using fossil fuels, more stringent air pollution regulations are expected to raise generating costs and consequently power tariffs.

13. Metals Week, New York, 8 February 1993.

14. Metals and Minerals Research Service: Metals Analysis and Outlook, third quarter 1993.

15. Metals Week, New York, 6 December 1993.

16. Quotas were distributed among individual European Community countries as follows: Germany 21,435 tons, Netherlands 20,869 tons, Italy 4,911 tons, Spain 1,316 tons, Belgium and Luxembourg 1,066 tons, United Kingdom 648 tons, Greece 454 tons and France 41 tons (Metal Bulletin, London, 23 August 1993).

17. Metal Bulletin, London, 13 September 1993.

18. Metal Bulletin, London, 6 January 1994.

19. See, for instance, letter from Wolf D. Breit, chief executive of Deeside Aluminium, in Metal Bulletin, London, 26 August 1993.

20. David Morton, chairman and chief executive officer of Alcan, commented: "It is of little use for one single national or regional government to impose quotas on CIS imports into their own territory. This merely diverts the problem. When you are filling a bath, it does not matter from which end you fill it. What matters is the level of the bathwater. In our case that is measured by the level of the LME inventories and hence the price of aluminium. Unless the problem is tackled on a concerted and negotiated basis, the current conditions are likely to persist and bring this industry to its knees." (Metal Bulletin, London, 21 October 1993)

21. Total of inventories of companies reporting to the International Primary Aluminium Institute (IPAI) and London Metal Exchange stocks. The actual increase is likely to have been somewhat higher since it is probable that unreported inventories increased as well.

22. See UNCTAD: Market situation and outlook for bauxite, alumina and aluminium (TD/B/CN.1/RM/BAUXITE/2), Geneva 1993.

23. Metal Bulletin Monthly, London, September 1993.

24. Metals Week, New York, 27 December 1993.

25. Metals Week, New York 17 January 1994.

26. Metal Bulletin, London, 17 July 1993.

27. The International Bauxite Association is quoted in Metal Bulletin Monthly, London, September 1993, as considering that the bauxite market has been showing a surplus of around 10 per cent recently.

28. American Metal Market, New York, 13 August 1993.

29. Metal Bulletin, London, 18 October 1993.

30. Mining Journal, London, 17 September 1993.

31. American Metal Market, New York, 9 September 1993.

32. Japan Metal Bulletin, Tokyo, 20 September 1993.

33. See note 12.

34. New smelter projects at the planning stage include several projects in Venezuela and in Chile, a joint venture between Jamaica and Trinidad and Tobago to be built in the latter country, and one project in each of Algeria, Iceland, Malaysia, Qatar and Saudi Arabia. In addition, expansions to several existing smelters are being studied.

35. Metal Bulletin, London, 16 September 1993.

36. In addition to the projects mentioned in table A.5 in the annex, several new alumina refineries are at the planning stage, including at least three in India and one in each of Greece, Indonesia and Jamaica.

ANNEX

Table A.1 Changes in bauxite mine production capacity 1992-1993

Country/operation	Owner	Change 1000 metric tons from end 1991	Effective date	Comment
Jamaica				
Alpart, Nain	Kaiser Hydro	**+500**	October 1992	Expansion
Suriname		**-1 000**		
Moengo	Alcoa	-2 000	End 1992	Shutdown due to exhaustion of reserves
Accaribo	Billiton Alcoa	+1 000	1992	New mine
Venezuela				
Los Pijiguaos	Government of Venezuela	**+2 000**	1993	Continuous expansion
Total		**+1 500**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.2 Changes in alumina refinery capacity 1992-1993

Country/operation	Owner	Change 1000 metric tons from end 1991	Effective date	Comment
Australia		**+780**		
Gove	Alusuisse Gove Alumina	+150	Early 1992	Expansion
Wagerup	Alcoa of Australia	+630	January 1993	Expansion
Brazil				
Alumar	Aluminio do Maranhao Alcoa Camargo Correa	**+200**	1992	Expansion
India				
Belgaum, Karnataka	Indalco	**+40**	February 1993	Expansion
Jamaica				
Alpart	Kaiser Hydro	**+250**	October 1992	Expansion
Venezuela				
Interalumina	Government of Venezuela	**+700**	1992	Expansion
Total		**+1 970**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.3 Changes in aluminium smelter capacity 1992-1993

Country/operation	Owner	Change 1000 metric tons from end 1991	Effective date	Comment
Australia				
Tomago	Pechiney Gove Aluminium Finance Australian Mutual Provident VAW Hunter Douglas	**+140**	November 1992	Expansion
Austria				
Ranshofen	Austria Metall	**-83**	End 1992	Shutdown
Bahrain				
Alba	Government of Bahrain Saudi Public Investment F. Breton Investments	**+235**	November 1992	Expansion
Canada		**+430**		
Alouette	Austria Metall Hoogovens Government of Québec VAW Kobe Steel Marubeni Corp.	+215	December 1992	New smelter
Deschambault	Alumax	+215	September 1992	New smelter
France				
Dunkerque	Pechiney Electricité de France Banque Nationale de Paris General Electric Norwich Union Suez Legal & General	**+215**	May 1992	New smelter
Germany				
Essen	Alusuisse	**-20**	Beginning 1992	Partial shutdown
India				
Belgaum, Karnataka	Indalco	**-73**	1992	Shutdown
Iran, Islamic Rep.				
Arak	Government of Iran	**+45**	1992/93	Expansion
Italy				
Fusina 2	Alumix	**-32**	May 1992	Shutdown
Total		**+857**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.4 Expected changes in bauxite mine production capacity 1994-1995

Country/operation	Owner	Change 1 000 metric tons from end 1993	Effective date	Comment
Brazil				
Trombetas	Mineraçao Rio do Norte Aluvale Alcan Alcoa Billiton CBA Hydro Reynolds	+1 500	1994	Expansion
India				
Panchpatmali	Government of India	+1 200	1995	Expansion
Jamaica				
Woodside	Government of Jamaica Alcoa	+500	1994	Expansion
Total		+3 200		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.5 Expected changes in alumina refinery capacity 1994-1995

Country/operation	Owner	Change 1 000 metric tons from end 1993	Effective date	Comment
Australia				
Wagerup	Alcoa of Australia	**+200**	Mid-1994	Expansion
Brazil				
Alunorte	Government of Brazil Nippon Amazon Aluminium Company	**+1 100**	1995	New refinery
Jamaica		**+300**		
Clarendon	Government of Jamaica Alcoa	+200	1994	Expansion
Ewarton & Kirkvine	Alcan Government of Jamaica	+100	1994	Expansion
Republic of Korea				
Mokpo	General Chemical Corp.	**+215**	1995	New refinery, non-metallurgical alumina
Total		**+1 815**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.6 Expected changes in aluminium smelter capacity 1994-1995

Country/operation	Owner	Change 1 000 metric tons from end 1992	Effective date	Comment
Australia				
Gladstone	Comalco Austria Metall Sumitomo Mitsubishi Kobe Steel Yoshida Kogyo	+30	1994	Expansion
France				
Venthor	Pechiney	-31	1994	Shutdown
Norway				
Husnes	Hydro Alusuisse	+32	1994	Expansion
South Africa				
Richards Bay	Alusaf	+466	Late 1995	New smelter
Switzerland				
Steg	Alusuisse	-50	Autumn 1994	Shutdown
Total		+447		

Source: UNCTAD secretariat, based on trade journals and information from industry